EFFECT OF DIFFERENT PROTEIN LEVELS ON THE GROWTH AND FEED EFFICIENCY OF SILVER BARB (*Barbodes gonionotus*) IN FERTILIZED PONDS

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ABSTRACT

This study proposed to establish a suitable protein level in feed formulation for silver barb in a semi-intensive pond. Fingerlings of fish of approximate one-month age were raised in floating cages set in fertilized ponds at a density of 36 fish per cage. Three isocaloric diets with different protein levels (20, 25 and 30%) were given to the fish at *ad libitum* twice a day for 30 days of the experimental period. The results indicated that an optimal dietary protein level for growth and feed eficiency of silver barb was about 25%. This dietary protein level resulted in low FCR. Therefore, it can be concluded that the diet for fingerlings of silver barb in fertilized ponds should be formulated to contain 25% protein.

KEYWORDS: **silver barb, tawes, *Barbodes gonionotus*, protein, pond**

INTRODUCTION

The herbivorous fish species, silver barb or tawes, *Barbodes gonionotus*, has been cultured semi-intensively in many Asian countries. Various feed ingredients and dietary protein levels were encouraged in Thailand (Sattar, 1987). According to Somsueb (1993), feed for herbivorous species was formulated with 30% fish meal, 45% fine rice bran, 24% peanut meal and 1% vitamin and mineral premix to contain 30% protein. In Cambodia, combination of organic fertilizer and supplementary feed of rice bran, corn meal, termites, red ants or aquatic vegetation was applied to silver barb ponds (Nuov & Nandeesha, 1993). In addition, commercial feed tends to be used in fish culture practices. However, feed in any form contributes the highest cost to total fish production. Reducing feed cost is encouraged. In this case, feed formulation for cultured fish in ponds needs to be determined (Wee, 1989).

In feed formulation, dietary protein for maximum potential growth rate of cultured fish needs to be determined (De Silva, 1989) because this ingredient plays a vital role in fish growth but is expensive. A wide range of dietary protein levels for maximum growth rate of herbivorous fish under laboratory conditions has been observed. Wee and Ngamsnae (1987) recommended about 35% dietary protein level for silver barb fingerlings. The dietary protein level for other herbivorous species such as *Oreochromis aureus* (Davis & Stickney, 1978); *O. niloticus* (De Silva & Perera, 1985); and *T. Zillii* (Mazid *et al.*, 1979) was about 30%. A study by De Silva & Gunasekera (1992) showed that different major carps in spite of their varying food habits required dietary protein at a level of 30%. Inclusion of natural foods affects the composition and amount of diet required by fish (Hepher, 1990; NRC, 1983) since they contain high protein, a material similar to growth promoters, vitamins, and minerals (Viola, 1990). However, there is no information of nutrient requirement for silver barb in ponds. The objective of this experiment, therefore, is to evaluate the effect of dietary protein on the growth and feed utilization of silver barb cultured in a fertilized pond.

MATERIALS AND METHODS

Feed and Feeding

Three isocaloric feeds containing different protein levels of 20, 25 and 30% respectively (Table 1) were tested in this experiment. The main source of protein in all feeds was soybean meal. Fish meal, rice bran, cassava starch, corn oil and fish oil were added in diet formulation. Commercial vitamin in this experiment was bought from CP. This mineral premix was adopted from NRC (1983).

Feeds were prepared to cover experimental feed requirements for two weeks. Feed ingredients were analyzed for their proximate composition. In addition, the quality of these feedstuffs was observed by smell, texture and color. Feed ingredients were mixed and thereafter cooked cassava starch was added. The resulting dough was converted into pellets using a Hobart-food mincer. Feeds were then dried. Dried feed was re-analyzed for proximate composition and stored in plastic bags.

Dry matter was determined by drying the sample in an oven at 105°C to reach a constant weight. Crude protein was determined using the Kjeldahl method in

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